UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trad mark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/771,275	01/26/01	PAPATHOMAS K	EN995064BVUS

005409
ARLEN L. OLSEN
SCHMEISER, OLSEN & WATTS
3 LEAR JET LANE
SUITE 201
LATHAM NY 12110

IM52/0806

EXAMINER	
BERMAN, S	
ART UNIT	**PAPER NUMBER**
1711	4

DATE MAILED: 08/06/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trad marks

Office Action Summary	Application No.	Applicant(s)	
	09/771,275	PAPATHOMAS ET AL.	
	Examiner	Art Unit	
	Susan W Berman	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 13-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 13-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Information Disclosure Statement

The information disclosure statement filed 01-26-2001 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each U.S. and foreign patent; each publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 25 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for toughening agents selected from the group consisting of "elastomers , epoxy-terminated elastomers and hydroxy-terminated polysulfone oligomers..., does not reasonably provide enablement for tougheners that are epoxy resins. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. The specification discloses that tougheners can be elastomers or rubber. The terms "elastomer" and "rubber" are alternate terms referring to the same tougheners. The only "epoxy resins" disclosed as tougheners are elastomers reacted with epoxy resins to give epoxy terminated elastomers. See page 28, second paragraph.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15, 16, 19-24 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 15: it is not clear from the phrase "includes compounds depicted by formulas 1 and 2" whether applicant intends to claim a method wherein the cyanate ester is selected from a formula 1 compound and a formula 2 compound or is a mixture of a formula 1 compound and a formula 2 compound. The phrase "preferably from 0 to 3" renders the claim indefinite. It is not clear what is meant by "non-interfering group". In the Markush Group set forth as definition of "A", several linking groups are repeated, i.e. "oxo" corresponds to "O", "sulfonyl" corresponds to "SO_2 ", etc.

Claim 16: lines 10-11, it is not clear what cyanate esters are intended to be included from the name "1,3-,...dicyanatonaphthalene".

Claim 19: "fused silica and amorphous silica" should be rewritten to read "fused silica or amorphous silica".

Claim 20: Does applicant intend to limit the size of the dispersed silica to 31 microns or less or to merely recite that some of the particles should have a particle size of 31 microns or less?

Claim 21: It is not clear how a coefficient of linear thermal expansion can "include" from about 26 to about 39 ppm/degree C. Is the coefficient variable? Does the cured composition contain parts with variable coefficients? If the claimed coefficient is intended to be from about 26 to about 39 ppm/degree C, it should be so stated.

Claim 22: : It is not clear how a glass transition temperature can "include" from about 100 to about 160 degrees C. Is the Tg variable? Does the cured composition contain parts with variable Tg? If the claimed Tg is intended to be from about 100 to about 160 degrees C, it should be so stated.

Claim 23: Te use of the phrase "preferably from 3 to 15 parts" renders the claim indefinite. It is not clear what "surface" the "surface treating agents" are intended to be applied to. If the surface treating agents are surface treating agents for the silica, it should be so stated.

Claim 24: does applicant intend to claim composition that include both thermally conductive fillers and electrically insulating fillers or to claim a composition including thermally conductive filler or electrically insulating fillers? The claims as written requires that both kinds of fillers be present.

Claim 26: It is not clear what is meant by a molecular weight "includes from about 500 to about 1,000 centipoise". The claim, as written, recites that a toughening agent in the composition has a molecular weight as recited but does not limit the toughening agent to one having the recited molecular weight. If applicant intends to recite that the molecular weight of the toughening agent is limited to the value set forth, it should be so stated. Molecular weight is not given the units "centipoise". See pages 28-29, wherein a molecular weight of 400 to 20,000 is set forth. It is not known from the disclosure whether these molecular weight are number average or weight average molecular weights.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 13-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gelorme et al (5,464,726).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide

and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring in the disclosed method.

Gelorme et al disclose compositions comprising a curable cyanate ester, a cationic photoinitiator, cycloaliphatic polyepoxide and a filler. Thus Gelorme et al teach that a cationic photoinitiator and photocuring can be employed to cure a composition analogous to the composition disclosed by Christie et al.

It would have been obvious to one skilled in the art to employ a photoinitiator and photocuring in the compositions and method disclosed by Christie et al, as suggested by Gelorme et al in analogous art. The reason is that Christie et al and Gelorme et al disclose compositions comprising the same polymerizable components. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring would provide the same product as heating since the polymerizable components are the same.

Claims 13-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of Gaku et al (4,554,346).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring in the disclosed method.

Gaku et al disclose curable resins comprising a cyanate ester compound, a hydroxy-functional ethylenically unsaturated compound and a photoinitiator that provide products having excellent heat

resistance and electrical properties. Reinforcing agents and fillers taught by Gaku et al include epoxy resins, elastic rubbers, silica, alumina and boron nitride (columns 6-7).

It would have been obvious to one skilled in the art to employ a photoinitiator and photocuring in the compositions and method disclosed by Christie et al, as suggested by Gaku et al in analogous art. The reason is that Christie et al and Gaku et al disclose compositions comprising the same polymerizable components. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring would provide the same product as heating since the polymerizable components are the same. It would have been obvious to one skilled in the art to include the reinforcing agents and fillers taught by Gaku et al in the compositions disclosed by Christie et al in order to obtain the reinforcing and filler properties of these additives taught by Gaku et al. With respect to claim 17, It would have been obvious to one skilled in the art to select diphenyliodonium initiator from those taught by Gaku et al because Gaku et al teach that any of the disclosed initiator/sensitizers can be used and because the compositions taught by Christie et al include epoxy compounds that are known to be photocurable in the presence of iodonium initiators.

Claims 13-16 and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christie et al (5,250,848) in view of McCormick et al (5,744,557).

Christie et al disclose a method for encapsulating C4 connections and pin heads (column 7, lines 1-16). Solder interconnections are filled with a composition comprising a cycloaliphatic polyepoxide and/or a curable cyanate ester and a filler having a maximum particle size of 31 microns and cured by heating. Christie et al do not teach employing a photoinitiator, such as an onium salt, and photocuring in the disclosed method.

McCormick et al teach cyanate ester/free radically polymerizable monomer adhesives for electronic adhesives. See column 19, line 611, to column 23, line 22. McCormick et al teach that the

disclosed catalyst system of organometallic curative and free radical generators may be activated thermally or photochemically or by both methods in combination (column 6, lines 37-40, and column 20, lines 17-21). Other photoinitaitors are taught in column 11, lines 40-50.

It would have been obvious to one skilled in the art to employ an organometallic catalyst system and photoinitiation, as taught by McCormick et al, in the compositions and method disclosed by Christie et al. The reason is that Christie et al and McCormick et al disclose compositions comprising the same cyanate ester and epoxy polymerizable components. McCormick et al teach that cyanate ester/epoxy compositions can be photocured and provide adhesives for electronic applications. Therefore, one of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation that photocuring the cyanate ester compositions taught by Christie et al would provide the same product as heating since the polymerizable compositions taught by McCormick et al also comprise cyanate esters.

Double Patenting

Claims 13-26 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-9 of U.S. Patent No. 6,129,955 in view of Christie et al. Although the conflicting claims are not identical, they are not patentably distinct from each other because the comprising language of the claims of US '955 encompasses compositions including a cyanate ester, such as the cyanate esters disclosed in columns 11-12 of the patent. Christie et al teach, in analogous art, that compositions comprising a cycloalipahtic polyepoxide and/or cyanate ester or prepolymer thereof are useful for providing a solder interconnection. It would have been obvious to one skilled in the art to include a cyanate ester compound in the polyepoxide compositions used in the method claimed in US '955 and to photocure the compositions as set forth in the claims.

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise

extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ayano et al (4,393,903) disclose cyanate ester compositions comprising a photoinitiator for use in adhesive assembly. Bolger teaches conductive adhesive performs comprising conductive and non-conductive fillers for area bonding of electronic components.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Berman whose telephone number is (703) 308-0040.

The fax number for this group is (703) 872-9310 or, for submissions after Final Rejection, (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application should be directed to the Customer Service telephone number (703) 306-5665.

Susan Berman

Susan Berman
Primary Examiner
Art Unit 1711

S B
7/31/01